CLAIMS:

What is claimed is:

1. A method of transmitting network data, the method comprising:
   a. assembling the data into a data frame;
   b. encapsulating the data frame into a data packet, the packet having a start field identifying the start of the packet and a data field including the data;
   c. appending idle data to the data packet to form a packet assembly;
   d. performing a cyclic redundancy check (CRC) of the data frame to obtain a CRC value; and
   e. adding the CRC value to the data packet.

2. The method of claim 1, further comprising:
   a. evaluating the packet assembly to obtain a disparity value; and
   b. if the disparity value indicates an incorrect disparity, changing the packet assembly.

3. The method of claim 2, wherein changing the packet assembly comprises changing the idle data.

4. The method of claim 2, wherein the data packet includes an end-of-packet field, and wherein changing the packet assembly comprises changing the end-of-packet field.

5. The method of claim 1, wherein the idle data comprises a comma character.

6. The method of claim 5, wherein the comma character includes five consecutive identical bits.

7. The method of claim 6, wherein the five consecutive identical bits are logic zeros.

8. The method of claim 1, wherein appending the idle data occurs before performing the CRC of the data frame.

9. The method of claim 1, further comprising adding an extension field to the data frame before encapsulating the data into a data packet.

10. The method of claim 1, further comprising programming programmable logic to assemble the data frame.

11. The method of claim 10, wherein the programmable logic does not perform the CRC.

12. The method of claim 10, wherein the CRC is performed using application-specific logic.

13. A network physical layer adapted to transmit a data frame and instantiated in application-specific logic, the physical layer comprising:
    a. a data node adapted to receive a data packet, the data packet including at least a portion of the data frame; and
    b. a CRC generator adapted to perform a CRC on at least a portion of the data frame to provide a CRC value and to insert the CRC into the data packet.

14. The physical layer of claim 13, wherein the data node is further adapted to receive idle data.

15. The physical layer of claim 14, wherein the data packet and idle data collectively form a packet assembly, the physical layer further comprising an encoder adapted to receive the packet assembly and to provide a disparity value that is a function of the packet assembly.

16. The physical layer of claim 15, further comprising a packet-assembly modifier connected to the encoder and adapted to receive the disparity value and to modify the packet assembly in response to the disparity value.

17. The physical layer of claim 16, wherein the packet-assembly modifier is adapted to modify the idle data.

18. The physical layer of claim 16, wherein the disparity value may be positive or negative.

19. The physical layer of claim 18, wherein the packet-assembly modifier modifies the idle data in response to the positive disparity value.

20. The physical layer of claim 18, wherein the packet-assembly modifier leaves unmodified the idle data in response to the negative disparity value.

21. The physical layer of claim 13, wherein the CRC generator further comprises a first module adapted to support a first communication standard and a second module adapted to support a second communication standard.

22. The physical layer of claim 13, wherein the CRC generator further comprises a force-error input terminal.

23. The physical layer of claim 22, wherein the force-error input terminal is adapted to receive a test signal for inducing the CRC generator to produce an error.

24. A programmable logic device comprising:
    a. an array of configurable logic blocks; and
    b. a network physical layer instantiated in hard

logic;

c. wherein the physical layer comprises at least one CRC generator adapted to perform a cyclic redundancy check.

25. The programmable logic device of claim 24, wherein the CRC generator is adapted to perform a plurality of CRC functions to support a plurality of communication standards.

26. The programmable logic device of claim 24, further comprising a data encapsulator adapted to receive a data frame and provide a data packet based on the data frame, wherein the CRC generator is adapted to perform a CRC on at least a portion of the data frame to obtain a CRC value and to insert the CRC value into the data packet.

27. The programmable logic device of claim 26, wherein the data encapsulator adds idle data to the packet to form a packet assembly, the programmable logic device further comprising a packet-assembly modifier adapted to modify the packet assembly based in part on the CRC value.

28. The programmable logic device of claim 27, wherein the packet-assembly modifier modifies the idle data.

29. The programmable logic device of claim 24, wherein the at least one CRC generator further comprises a force-error input terminal.

30. The programmable logic device of claim 29, wherein the force-error input terminal is adapted to receive a test signal for inducing the CRC generator to produce an error.

31. A network receiver adapted to receive data and instantiated in application-specific logic, the network receiver comprising a physical layer having a data node adapted to receive a packet assembly, the packet assembly including at least a portion of the data, and a CRC generator adapted to perform a CRC on at least a portion of the packet assembly to provide a calculated CRC value.

32. The network receiver of claim 31, wherein the packet includes a packet CRC value, the physical layer further comprising a CRC compare circuit adapted to compare the packet CRC value to the calculated CRC value

33. The network receiver of claim 32, further comprising a link layer connected to the CRC compare circuit.

34. The network receiver of claim 33, wherein the CRC compare circuit of the physical layer identifies mismatches between the packet CRC and the calculated CRC for the link layer.

35. The network receiver of claim 33, wherein the link layer is adapted to reject defective packets, and wherein the link layer relies upon the CRC compare circuit in the physical layer to identify the defective packets.

36. The network receiver of claim 31 wherein the CRC generator is adapted to perform a plurality of CRC functions to support a plurality of communication standards.